

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE BEFORE THE  
BOARD OF PATENT APPEALS AND INTERFERENCES

Attorney Reference: 33820-23

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In re Application of: Quintens et al.	Art Unit: 1774
Serial No.: 09/782,835	Examiner: Dicus
Filed: 2/14/2001	Appeal No.: TBD
Entitled: IMPROVED INK JET RECORDING MEDIUM	Conf. No.: 1614

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**APPEAL BRIEF**

Mail Stop Appeal Brief - Patents  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

This is an appeal from the final rejection of the Examiner dated May 24, 2007 rejecting claims 1, 4-8, 10-18 and 20-24 of the application listed above. A Notice of Appeal was mailed August September 20, 2007. The Brief is accompanied by the requisite fee set forth in \$1.17(c).

REAL PARTY IN INTEREST

This application is assigned to Agfa-Gevaert who is the real party in interest.

#### RELATED APPEALS AND INTERFERENCES

No related appeals and no relevant interferences are known to the appellant.

#### STATUS OF CLAIMS

Claims 1, 4 and 10 are presented as amended on July 20, 2007.

Claims 6-8 and 11-16 are present as originally filed on February 14, 2001.

Claims 20-24 are present as newly entered on February 28, 2007.

Claims 5, 17 and 18 are present as amended on September 11, 2006.

#### STATUS OF AMENDMENTS

There are no outstanding amendments.

#### SUMMARY OF THE CLAIMED SUBJECT MATTER

The invention under appeal is related to ink jet print media with a specified support and a specific ink receiving layer coated thereon.

The support is selected from a group consisting of PET, wet strength paper, PVC, PVC with an adhesive backing,

polypropylene, polycarbonate a subbed polymeric support, a canvas support, polypropylene-coated paper, polyethylene-coated paper and polyethylene paper. The ink receiving layer comprises three components defined as a pigment, a binder and a film-forming polymer. The pigment consists essentially of a porous inorganic silica. The binder has silanol modified polyvinyl alcohol as a principal binder and a film-forming polymer having a glass transition temperature  $T_g$  lower than 50°C.

#### MAPPING OF INDEPENDENT CLAIMS TO SPECIFICATION

Claim 1 is the sole independent claim under appeal. The subject matter of claim 1 is mapped to the paragraph numbering of the specification published as US Publ. No. 2001/0024713 as follows:

Claim 1. An ink jet recording element [0032] comprising a support [0032] selected from a group consisting of PET [0063], wet strength paper [0063], PVC [0063], PVC with an adhesive backing [0063], polypropylene [0063], polycarbonate [0063] a subbed polymeric support [0062], a canvas support [0063], polypropylene-coated paper [0062], polyethylene-coated paper [0063] and polyethylene paper [0063] and an ink receiving layer [0032] wherein said ink receiving layer comprises (a) a pigment [0032] consisting

essentially of a porous inorganic silica [0038], (b) a binder or binder mixture with silanol modified polyvinyl alcohol [0032] as a principal binder, and (c) a film-forming polymer having a glass transition temperature  $T_g$  lower than 50°C [0032].

GROUND FOR REJECTION TO BE REVIEWED ON APPEAL

Appellant seeks review of the rejection of claims 1, 6-8, 10, 16 and 20-24 under 35 U.S.C. 103(a) as being unpatentable over Kawano et al. in view of Santo et al.

Appellant seeks review of the rejection of claims 1, 4-8, 16-18 and 20-24 under 35 U.S.C. 103(a) as being unpatentable over Kawano et al. in view of Smith-Klein et al.

Appellant seeks review of the rejection of claims 11-15 under 35 U.S.C. 103(a) as being unpatentable over Kawano et al. in view of Smith-Klein et al. in view of Mochizuki et al. and further in view of Nordeen et al.

Appellant seeks review of the rejection of claims 11-15 under 35 U.S.C. 103(a) as being unpatentable over Kawano et al. in view of Santo et al. in view of Mochizuki et al. and further in view of Nordeen et al.

Appellant seeks review of the rejection of claims 10 and 23 under 35 U.S.C. 103(a) as being unpatentable over Kawano et al.

in view of Santo et al. and alternatively in view of Smith-Klein et al. and further in view of Mukoyoshi.

#### ARGUMENTS

Claims 1, 6-8, 10, 16 and 20-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawano et al. in view of Santo et al.

Kawano et al. is cited as disclosing modified PVA. As noted by the Examiner Kawano et al. does not recite silanol modified PVA. Santo et al. is cited as disclosing modified PVA.

Kawano et al. is also cited as disclosing a pigment as a main component and therefore is relied on as teaching a media consisting essentially of silica.

The Examiner has opined that it would be obvious to utilize the silanol modified PVA as the modified PVA of Kawano et al. thereby teaching the invention of the instant claims. Applicants respectfully disagree based on the fact that such a combination is in direct conflict with Santo et al.

In the Advisory Action the Examiner stated that Santo was not relied on for the teachings of a formulation consisting essentially of silica. Applicants fully appreciate this distinction. However, the Examiner has failed to consider the teaching of Santo which are related to the silica. In col. 8, lines 58-65 Santo clearly addresses the pigments. In

particular, Santo states that if one used more than 50%, by weight, untreated pigment the effect according to the invention described therein would not be expected. Both the present invention and Kawano are directed to untreated pigment as defined in Santo.

Therefore, one of skill in the art would arrive at a conundrum if they attempted to follow the logic set forth by the Examiner. If they used the silanol modified PVA for the properties expected therein they would also reduce the amount of silica to less than 50% by weight. Such a combination is not the same as the claimed invention.

Contrarily, if one of skill in the art utilized the silanol modified PVA without reducing the amount of silica to less than 50% by weight they would not expect to realize the advantages offered by the teachings of Santo and therefore they would have no incentive to make such a substitution.

The Examiner has created a hindsight reconstruction which forces one of skill in the art to decide between an embodiment which is different from the instantly claimed invention and an embodiment wherein the combination of materials selected has no advantage. The Examiner has then selected the embodiment wherein no advantage is offered, and which is therefore contrary to the cited teachings, to render an opinion of obviousness.

Appellants respectfully request relief from the final rejection of claims 1, 6-8, 10, 16 and 20-24 under 35 U.S.C. 103(a) based on Kawano et al. in view of Santo et al. as being an impermissible hindsight reconstruction which is in direct contradiction to the teaching of the cited art.

Claims 1, 4-8, 16-18 and 20-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawano et al. in view of Smith-Klein et al.

Kawano et al. is cited as disclosing a support, an ink receiving layer consisting essentially of silica, a film forming latex and modified polyvinyl alcohol. As pointed out by the Examiner Kawano et al. fails to teach silanol modified PVA. Smith-Klein et al. is cited as teaching silanol modified PVA. The Examiner has opined that it would be obvious to one of ordinary skill in the art to add the silanol modified PVA of Smith-Klein et al. into the coating of Kawano et al. Applicants respectfully disagree.

Smith-Klein et al. clearly teaches that the silanol modified PVA and a mineral surface (silica) react. As set forth in col. 2 lines 50-57, the reactive coupling agent (silanol modified PVA) reacts with the mineral surface (silica) thereby coupling the ink to the surface. One of skill in the art would

readily realize that incorporating the silica into the same layer containing the reactive coupling agent would necessarily cause a premature coupling reaction irrespective of the presence of the ink. This would be expected to ruin the film with regards to ink adherence and destroy the utility of the media.

In summary, Kawano et al. recites the combination of modified PVA and silica but fails to recite that the modified PVA is silanol modified PVA. Smith-Klein et al. teaches silanol modified PVA and teaches that it reacts with silica and therefore the silica is included in the ink such that upon printing the silica and silanol modified PVA will react to form a bond. The Examiner has then found it obvious to include both reactant species in the same layer thereby causing them to react prematurely and eliminating the function of both. It is impossible to classify this as anything but a hindsight reconstruction based on the present application.

Assuming, *arguendo*, that one did consider the hindsight reconstruction of the Examiner they would expect the system to be inoperative. The purpose of the silica and silanol modified PVA is to react such that a bond is formed. Why would one of skill in the art want to react the ingredients prematurely?

Applicants respectfully request relief from the final rejection of claims 1, 4-8, 16-18 and 20-24 under 35 U.S.C. 103(a) based Kawano et al. in view of Smith-Klein et al. as it



is a hindsight reconstruction made in direct conflict with the teachings of the cited references. One of skill in the art would be led away from the hindsight reconstruction based on the expectation of inoperability.

Claims 11-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawano et al. in view of Smith-Klein et al. in view of Mochizuki et al. and further in view of Nordeen et al.

Kawano et al. and Smith-Klein et al. are discussed above and all previous comments are equally applicable herein.

The Examiner correctly notes that the combination of Kawano et al. and Smith-Klein et al. fails to recite an adhesive polymer disposed between the support and ink receiving layer. Nordeen is cited as disclosing an adhesive polymer between the support and ink receiving layer and Mochizuki is cited as teaching the specific polymers of claims 12-14.

As set forth above Kawano et al. and Smith-Klein et al. teach against a layer comprising both a silica and a silanol modified PVA as an ink jet receiving material. As discussed above this would be expected to render the receiver inoperative for the intended task. Therefore, the combination of Kawano et al. and Smith-Klein et al. is deficient.

Neither Nordeen nor Mochizuki provide any teachings wherein one of skill in the art would be lead to ignore the teachings of

the reactivity of silanol modified PVA and silica and therefore neither reference mitigates the deficiency of the primary references.

Even with Nordeen and Mochizuki one of skill in the art would still be expected to avoid including silanol modified PVA in a layer comprising silica due to the expected reaction thereby rendering the material inoperative.

Appellants respectfully request relief from the final rejection of claims 11-15 under 35 U.S.C. 103(a) based on Kawano et al. in view of Smith-Klein et al. in view of Mochizuki et al. and further in view of Nordeen et al. due to the failure of the secondary references to mitigate the deficiency of the primary references.

Claims 11-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawano et al. in view of Santo et al. in view of Mochizuki et al. and further in view of Nordeen et al.

Kawano et al. and Santo et al. are discussed above and all previous comments are equally applicable herein.

As set forth above Santo et al. clearly teaches away from a layer comprising silanol modified PVA and a pigment consisting essentially of silica. While not being restricted to any theory this is not surprising in light of Smith-Klein et al. wherein the reaction of silanol modified PVA and silica is described.

If one did attempt to make the combination suggested by the Examiner the silanol groups of the PVA and the silica would be expected to react thereby rendering the media inoperative.

One of skill in the art would therefore only consider utilizing silica and silanol modified PVA if the pigment was less than 50% by weight untreated silica.

Neither Nordeen nor Mochizuki provide any teachings wherein one of skill in the art would be lead to ignore the teachings of the reactivity of silanol modified PVA and silica and the necessity to have below 50% by weight silica. Therefore neither reference mitigates the deficiency of the primary references.

Even with Nordeen and Mochizuki one of skill in the art would still be expected to avoid including silanol modified PVA in a layer comprising a pigment consisting essentially of silica due to the expected reaction which would render the material inoperative.

Appellants respectfully request relief from the final rejection of claims 11-15 under 35 U.S.C. 103(a) based on Kawano et al. in view of Santo et al. in view of Mochizuki et al. and further in view of Nordeen et al.

Claims 10 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawano et al. in view of Santo et al. and

alternatively in view of Smith-Klein et al. and further in view of Mukoyoshi.

Kawano et al., Santo et al, Smith-Klein et al. and Mukoyoshi are all discussed above and all comments are equally applicable here.

Kawano et al. is cited as teaching a pigment layer consisting essentially of silica but fails to teach silanol modified PVA.

Santo et al. is cited as teaching the use of silanol modified PVA but only if the amount of silica is less than 50% by weight.

Smith-Klein et al. is cited as teaching silica and silanol modified PVA but only one is in the ink layer and the other is in the media due to the reactivity of the two components. Smith-Klein et al. augments the teachings of Santo et al. since the necessity of a low amount of silica is expected to reduce the reaction between the silica and silanol groups of the PVA.

Based on the combined teachings of Santo et al. and Smith-Klein et al. a skilled artisan would be expected to have less than 50% by weight silica in the layer comprising the silanol modified PVA and preferably the silica and silanol modified PVA would be separated to avoid premature reaction. The Examiner has ignored this clear teaching and, in direct contradiction, considered it obvious to combine the silica and silanol modified

PVA. Such a combination is in direct conflict with the cited art and motivated only by the instant application.

Mukoyashi is cited as teaching specific adhesive polymers. There is no teaching in Mukoyashi whereby a skilled artisan would consider ignoring the teachings of Santo et al. and Smith-Klein et al. with regards to the teachings against combining silica and silanol modified PVA.

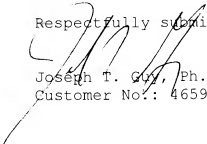
Appellants respectfully request relief from the final rejection of claims 10 and 23 under 35 U.S.C. 103(a) based on Kawano et al. in view of Santo et al. and alternatively in view of Smith-Klein et al. and further in view of Mukoyoshi.

#### CONCLUSION

The rejection of all claims has been traversed. Appellants request that all claims be passed to issuance in an expeditious manner.

Respectfully submitted,

November 19, 2007

  
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## CLAIMS APPENDIX

1. (previously presented) An ink jet recording element comprising a support selected from a group consisting of PET, wet strength paper, PVC, PVC with an adhesive backing, polypropylene, polycarbonate a subbed polymeric support, a canvas support, polypropylene-coated paper, polyethylene-coated paper and polyethylene paper and an ink receiving layer wherein said ink receiving layer comprises (a) a pigment consisting essentially of a porous inorganic silica, (b) a binder or binder mixture with silanol modified polyvinyl alcohol as a principal binder, and (c) a film-forming polymer having a glass transition temperature  $T_g$  lower than 50°C.

2-3. (cancelled)

4. (previously presented) An ink jet recording element according to claim 1 wherein said silica is an amorphous silica having an average particle size between 1  $\mu\text{m}$  and 15  $\mu\text{m}$ .

5. (previously presented) An ink jet recording element according to claim 1 wherein said silanol modified polyvinyl alcohol has a silanol modification degree between 0.1% and 10% and

a viscosity of between 1 and 25 mPa.s measured as a 4% aqueous solution.

6.(Original) An ink jet recording element according to claim 1 wherein said film-forming polymer having a  $T_g$  lower than 50 °C is a latex.

7.(Original) An ink jet recording element according to claim 6 wherein said latex is a copoly(styrene-butadiene) latex.

8.(Original) An ink jet recording element according to claim 6 wherein said latex is an acrylate latex.

9.(cancelled)

10.(previously presented) An ink jet recording element according to claim 1 further comprising a cationic mordant wherein said cationic mordant is a poly(diallyldimethylammonium chloride) or a dimethylamine-epichlorohydrine copolymer.

11.(Original) An ink jet recording element according to claim 1 wherein said element further comprises an adhesive undercoat layer containing an adhesive polymer between said support and said ink receiving layer.

12. (Original) An ink jet recording element according to claim 11 wherein said adhesive polymer is a copoly(styrene-butadiene) latex.
13. (Original) An ink jet recording element according to claim 11 wherein said adhesive polymer is an acrylate latex.
14. (Original) An ink jet recording element according to claim 13 wherein said acrylate latex is ethylacrylate-hydroxyethylmethacrylate copolymer.
15. (Original) An ink jet recording element according to claim 11 wherein said adhesive polymer is a vinylester latex.
16. (Original) An ink jet recording element according to claim 1 wherein said support is an opaque support.
17. (previously presented) An ink jet recording element according to claim 1 wherein said silanol modified polyvinyl alcohol is obtained from hydrolysing a copolymer of vinyl acetate and a silane monomer selected from a group consisting of vinyltrimethoxysilane, methacroyloxypropyl trimethoxysilane, triisopropoxyvinylsilane, and methacrylamidopropyl triethoxysilane.



18. (previously presented)      An ink jet recording element according to claim 1 wherein the polyvinyl alcohol is modified by reaction with one of  $\beta$ -3,4-epoxycyclohexylethyltrithoxysilane,  $\gamma$ -glycidyloxypropyl trimethoxysilane or isocyanatopropyl triethoxysilane.
19. (cancelled)
20. (previously presented)      An ink jet recording element according to claim 1 comprising a top layer on the ink-receiving layer.
21. (previously presented)      An ink jet recording element according to claim 20 wherein the top layer has a dry coverage between 0.5 and 5 g/m<sup>2</sup>.
22. (previously presented)      An ink jet recording element according to claim 20 wherein a cationic mordant is present in the top layer and not in the ink receiving layer.
23. (previously presented)      An ink jet recording element according to claim 22 wherein the cationic mordant is a poly(diallyldimethylammonium chloride) or a dimethylamine-epichlorohydrine copolymer.
24. (previously presented)      An ink jet recording element according to claim 1 further comprising at least one of a cationic mordant, a surfactant, a hardening agent, a

plasticizer, a whitening agent and a matting agent.

## EVIDENCE APPENDIX

None

## RELATED PROCEEDINGS APPENDIX

None